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ABSTRACT

This document describes a project whereby a researcher spent time in a fifth-grade classroom teaching students to use electronic mail. For two 40-minute periods each week over a period of 18 weeks, 28 students received instruction on mechanics such as sending and reading mail, attaching and retrieving files, and forwarding messages with their own comments. In addition, the students were taught many of the responsibilities that accompany electronic mail usage, including managing bandwidth and hard drive space as well as observing Internet etiquette by, among other things, being concise and polite. Success was to be represented by a percentage of students displaying mastery of skills or etiquette rules at various points in the program. Their success was measured by teacher observation, teacher-administered tests, and e-mail feedback to the researcher from both students and teachers. Results showed that students fell short of the goal only in the area of mail forwarding. Appendices include sample tests, an observation checklist, comments from netiquette violation surveys, a recap of netiquette rules, and software evaluations. (Contains 21 references.) (BEW)

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**Driver's Education
for the Information Super Highway:
Computer Mediated Communication
on a Local Area Network**

by

Beverly M. Kilgore

A Practicum Report

**Submitted to the Faculty of the Abraham S. Fischler Center
for the Advancement of Education of Nova Southeastern
University in partial fulfillment of the requirements
for the degree of Master of Science.**

**The abstract of this report may be placed in a
National Database System for reference.**

August/1995

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Abstract-Final Report

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Training/Elementary Education.

The Information Age has arrived. The need for a system to introduce elementary aged students to computer mediated communication was addressed through the use of electronic mail on a school's local area computer network. Local communication was introduced in anticipation of global communication via the Internet.

Students were taught responsible use of finite resources such as bandwidth and hard drive space, along with proper Internet etiquette on a local area network (LAN) allowing for learning to occur in a highly controlled environment. Levels of success were measured by teacher observation, teacher administered tests, and campus feedback from students and teachers using e-mail.

Students fully embraced the opportunity to use computer mediated communication. All students successfully managed their resources and mastered Internet etiquette. Appendices include student post-tests, teacher observation checklist, survey samples, and Netiquette Rules handbook.

Authorship Statement/Document Release

Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my work, presented here, will earn similar respect.

Beverly M. Kilgore
student's signature

Document Release

Permission is hereby given to Nova Southeastern University to distribute copies of this applied research project on request from interested parties. It is my understanding that Nova Southeastern University will not charge for this dissemination other than to cover the costs of duplicating, handling, and mailing of the materials.

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Verification of Practicum Activity

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Practicum students in Nova's M.S. and Ed.S. programs are asked to provide external verification that the project activities reported in their final practicum documents took place as described. You have been designated an observer to fulfill this confirmation function by the student named below. On this sheet, then, please write a note attesting to your knowledge of the project activity described in the final practicum report to which this will be attached. (Note that you are not asked to evaluate or make judgments about the quality of the project.)

Practicum Title On-Campus Computer Electronic Mail:

Driver's Education for the Super Information Highway

Student's Name Beverly M. Kilgore

Project Site Sonoran Sky Elementary School Date June 5, 1995

Observer's Name Kathy Wiebke
please print *please sign*

Observer's position Fifth Grade Teacher Phone # 502-493-6340

Observer's comment on impact of the project (handwritten):

Beverly Kilgore instructed my fifth grade class on electronic mail. She met with my students two times a week (40 minute each class period) for a total of 18 weeks.

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CHAPTER I:

Purpose

School and Community Setting

This practicum project took place in a rapidly growing suburb, population 165,430, of a large metropolitan city, population 1.85 million, in the southwestern United States. The district was established in 1919 and has grown to be the third largest district in the state. The district was comprised of approximately 70,000 residences in a 98 square mile area. The total district student enrollment of 31,280 was serviced by four high schools, five middle schools, and 23 elementary schools. Seventy percent of the students in this district continued on to college. The district operated under a \$119.5 million budget employing 1,700 certified and 1,500 classified staff members. Due to a 4.3 percent student growth rate, the district projected the need to add one new elementary school a year until the year 2000.

In 1987 the voters of the district approved a bond election calling for the enhancement of technology in all schools throughout the district. As a result of this funding, all elementary schools in the district house two computer labs, a six to eight computer media center cluster, and provide computers to all district certified staff. Thus, the total number of computers on every elementary campus is over 100. Two elementary campuses chose to maintain only one computer lab, with computers from the second lab distributed to classrooms. This was the case with the school in this study.

The school in this project was in its inaugural year. It had an award-winning staff receiving such prestigious honors as: State Teacher of the Year Semifinalists in five of the past six years, US WEST Teacher of the Year, Christa McAuliffe Teacher of the Year, Presidential Science Teacher of the Year, State English Teacher of the Year Semifinalist, and State Science

Teacher of the Year Semifinalist. The principal has received recognition as administrator of a State A+ School, U.S.

Department of Education Blue Ribbon School, City Business Partnership of the Year Award, and State Exemplary Fine Arts Site.

In 1994, the school was selected by the State Department of Education as one of 32 kindergarten through twelfth grade schools statewide to participate in a two year "Journey School" project. The purpose of the project is to build leadership capacity of school/community teams working to bring about systemic change in mathematics and science teaching, learning, and assessment.

The school supported an enrollment of 704 students distributed according to the data in Table 1 on the following page.

Table 1
Project Site Student Distribution

Grade Level	No. of Sections	No. of Students
Preschool	4	28
Kindergarten	4	84
First	4	109
Second	4	94
Third	3	79
Fourth	4	112
Fifth	3	84
Sixth	4	114

The school also contained two resource classrooms for children with learning disabilities, a hearing impaired preschool class, two resource rooms for honors classes, two Reading Recovery classrooms, art, music and band classrooms, a math/science/technology lab, a computer lab, a fine arts gallery, a publishing center, a media center, and a multi-purpose/cafeteria.

There were 39 certified employees in the school setting. This included 23 classroom teachers, a media specialist, an art teacher, a music teacher, a speech teacher, 1.5 honors teachers, a nurse, a psychologist, two office support persons, and an administrator.

All students were required to study art, music, and physical education in addition to traditional academic subjects. Students in grades one through three were also required to study library sciences while students in grades four through six were required to study computers. In grades four through six, students were offered the opportunity to study band and strings if desired.

The socioeconomic levels of students attending this school consisted of upper-middle income families, with 3.5 percent of the students receiving free or reduced lunches. The majority of students were Caucasian, with two percent of the population non-Caucasian. An active parent community was reflected by 91 percent of parents attending parent conferences and 61

percent attending parent meetings. The school was only one of two schools in the district to offer a before- and after-school extended day program to students taught by a certified teacher.

The suburban city in which the school was located had established a school partnership with the school. The city housed staff on campus providing a satellite location for numerous city services including city library book drop off, utility payments, voter registration and information on current events in the city.

The author of this project was the computer teacher. The author had been employed in the district since 1979, teaching third and fourth grades before becoming a computer teacher five years ago. The computer teacher serviced 310 students in grades four through six. Students attended computer class once every four days for a 40 minute period. The classroom teacher was not required to attend computer class with the students.

The computer teacher was responsible for supporting the technology available at the site. This support included formal and informal computer training for staff, students and parents, hardware and software trouble-shooting, software and system installation and update, local and global network support, equipment inventory, and computer assignments to staff.

Prior to the opening of this new school, the computer teacher was directly involved in the design and installation of the state of the art technology available at the project site. Close to \$500,000 was allocated by the district for hardware and software equipment. Hardware purchases included 110 computers with internal CD-ROM drives, laser printers, dot-matrix printers, ink-jet printers, personal digital assistants, scanners, laptop computers, overhead projection system, network modem, digital cameras, video cameras, file servers, laser disc players, an integrated telecommunication telemedia

system, and a full campus ethernet network. Software purchases reflected the district's computer education foundation statement that emphasized the integration of technology with other curriculum areas in the form of software, CD-ROMs and laser discs.

Problem Statement

The technological age requires schools to provide a new curriculum for students. It challenges teachers and policy makers to make changes fast enough to keep up with new technology. A specific example of this problem is the emergence of the Internet.

The Internet today is providing connections between people that span time and distance. Such connections have had major political, social and economic implications. (Toffler, 1990) The Internet expands classroom resources dramatically by making many resources from all over the world available to students. Unfortunately, almost two-thirds of the nation's public schools do not have access to the Internet (U.S. Dept. of

Education, 1995). According to Education Secretary Richard W. Riley, "The abundant learning resources available on the information superhighway are still out of reach for most of our teachers, students and parents."

Students in the target school did not use the Internet. At the time of this study, district policy, according to the Assistant Superintendent for Instruction, stated that no student will employ the Internet because of concerns over the possible access to controversial materials. A district level committee was being formed to address issues surrounding student use of the Internet.

In addition to district policy forbidding student access to the Internet, the district computer education/application curriculum, approved by the school board in 1994, made no mention of the Internet's use. Considering the rapid evolution of technology, it is challenging to develop a computer curriculum that remained current. This curriculum policy was not set for formal review until 1997.

The school's administrator and one hundred percent of the teachers interviewed indicated that curriculum designed to prepare students for using the Internet would be beneficial. Teachers also expressed concern that students not using the Internet would be at a distinct disadvantage. Teachers' responses to a survey regarding their interest in various uses of the Internet are shown in Table Two.

Table 2

Teacher Interest in Use of Internet

Area of Potential Network Use	Percent of Teachers Expressing Interest
Research	83
Key Pals	75
Cultural Awareness	58
Parent Communication	67
Student Discussion Groups	50
Teacher Discussion Groups	42
Other	17

The Journey School team at the target school unanimously supported the use of the Internet by students and teachers. The Journey School team also agreed that preparation for use of the Internet should begin in fifth grade. Fifth grade students have the reading and developmental skills necessary to begin using the Internet. Fifth graders also remain on campus one more year allowing them to offer support to next year's new users.

The problem addressed in this practicum was that there was no curriculum in existence in the target school to ready students for the eventual arrival of the super information highway. The target group was a fifth grade class consisting of 16 boys and 12 girls. Ages ranged from ten to twelve. Eighty-six percent of the students in the target group had personal computers at home. Only three percent of the target group had ever used the Internet and electronic mail. 14 percent of the students in the target group had a parent who was also a staff

member at the target site, including the principal's child. The homeroom teacher for the target group was enthusiastic about the use of technology in the fifth grade curriculum and had acquired the skills needed to support its enhancement in the classroom.

Classroom teachers expressed their belief that if students were provided with adequate training in the use of electronic mail as a communication tool, integration of existing hardware and software into the existing curriculum would occur more easily. Teachers were excited about connecting students and teachers to each other and to others beyond the school walls.

A sixth grade teacher expressed interest in using telecommunications for her students based on her discussions with science experts she worked with on state level science committees. As she saw it, "My students' inability to use telecommunication tools is the only thing holding up the show."

Another teacher expressed an interest in converting her students' pen pals to key pals. Key pals are pen pals who communicate digitally over computer networks, rather than

through the U.S. Mail. She said, "We have the equipment we need for our students to connect to other students using computers, they just need some training on how to do it."

The principal supported use of electronic mail as evidenced by the following quote:

"The differences I expect to see if all students were trained in E-Mail and began to use it are:

- greater awareness and excitement about E-Mail as a communication tool,
- greater motivation which would ultimately encourage more student writing,
- a huge increase in the use of E-Mail (as evidenced by my own daughter's desire . . . each night she asks me . . . 'Mom, did you bring home your laptop?'),
- a greater sense of 'COMMUNITY' amongst adults and students - where staff members get to know and understand their students on a different level and where students get to know each other better and appreciate each other's diversity.

Issues that would need to be addressed include:

- student ability to use as a tool . . . teacher willingness to facilitate and accommodate student use,

- guidelines/expectations about teacher/staff time for response . . . what is reasonable and what is expecting too much?,
- supervision of messages sent/received so it didn't become a tool for inappropriate messages.

I am most excited about the potential this brings for student writing as well as the greater 'sense of community.' This would bring a special linkage between student and student, student and adult, which could have very powerful results. I think this is especially ironical, because what some would feel to be an impersonal tool could, in fact, create greater sensitivity to the individual!"

Parents were also aware of the educational potential involved in training students in the use of telecommunication tools. In fact, one parent offered \$35,000 as part of a business partnership to fully connect all computers at the school to the Internet through a high-speed telecommunication line.

If conditions were ideal, all members of a school's community would be connected electronically. A large part of this connection would involve electronic mail. Students, in a seamless fashion, would responsibly connect to others submitting assignments, asking questions, and

gathering/sharing information. Parents would communicate with their child(ren) and teachers digitally from their homes and workplaces. Teachers and staff would communicate beyond the traditionally confining walls of the classroom sharing ideas and research. Overall, a community of communicators would evolve.

Outcome Objectives

In designing a Driver's Education Course for the Internet for fifth grade students the author proposed to accomplish the following objectives:

1. Ninety percent of the study group would be able to list all ten Netiquette Rules of the Road for electronic mail after two weeks of implementation of the Driver's Education for the Internet program. Students having difficulty listing all ten rules would receive additional tutoring by the author until they were able to attain this goal. Evidence would be copies of the test created by the students

(Appendix A: 45). The author chose 90 percent because it was reasonable to assume that given multiple trials, all students would achieve this objective.

2. After three weeks of implementation, 100 percent of the study group would be able to send and receive a message to and from the author as evidenced by the author's and student's receipt of the message at a computer. The author chose 100 percent because participants were highly motivated to send and receive electronic mail messages.
3. Seventy-five percent of the study group would be able to attach and retrieve a file with an electronic mail message to the author after four weeks of implementation. Evidence would be receipt and retrieval of the attachment by the author and student at a computer as notated on the Observation Checklist (Appendix B: 48). The author chose 75 percent because this criteria realistically addressed a more advanced feature of electronic

mail; one that some users could function without.

4. One hundred percent of the study group would be able to delete a message from the author in their electronic mailboxes after six weeks of implementation. Evidence would be notated by author on the Observation Checklist (Appendix B: 48). The author chose 100 percent because this was a elementary skill.
5. Eighty percent of the study group would be able to append comments to an electronic message from the author and forward the appended message to the principal after seven weeks of implementation. Evidence would be receipt of the appended message at the principal's computer notated on the Observation Checklist (Appendix B: 48). The author chose 80 percent because of the complexity of this objective.

6. After twelve weeks of implementation, 85 percent of the study group would have no violations of the school's Netiquette Rules of the Road as evidenced by the author on the Observation Checklist (Appendix B: 48). Staff and students would also be surveyed regarding violations of the Netiquette Rules (Appendix C: 50). The author chose 85 percent because this was a standard educational measure for success.

CHAPTER II:

Research and Solution Strategy

The Information Age has arrived. School communities are besieged with technologies once reserved for the business world such as the Internet. It has been said that the frenzy involved with technology today is comparable in magnitude to the frenzy experienced with the Beatles!

Predicting the impact this change could have on schools and the directions it could go can be facilitated by use of technological forecasting and assessment tools (Itzkan, 1994). Traditionally business and government have used technological assessment and forecasting tools to determine the importance of a technology, how fast the technology is changing, and how best to implement its use. The four tools used to assess and forecast technology are (1) expert opinions, (2) leading indicator analysis, (3) trend analysis, and (4) diffusion theory. Using these tools to examine technology in schools, Itzkan has concluded, "An era of comprehensive instructional networking

is on its way." This networking will travel the Super Information Highway, also known as the Internet.

Today almost two-thirds of the nation's public schools report they have no access to the Internet. In a challenge to the telecommunications industry, Vice President Gore urged telephone and cable companies to work with states and local communities to connect classrooms to the information superhighway by the year 2000. Even though only three percent of the nation's classrooms currently use the Internet, the everyday use of the Internet in schools is unavoidable. Computer networks are currently employed to assist students' collaborative investigations, electronic delivery of instructional materials, students' and teachers' access to information in libraries and databases, student's and teachers' access to scientific expertise, teacher education and collaboration, and electronic publishing of students' products. (Hunter, 1992) The Internet supports information literacy for lifelong learning.

The application of technology offers global resources to students. Information is increasing rapidly. The body of human knowledge doubles every five to six years. (Wishnietsky, 1991)

The Internet allows students to send and receive entire files of information along with access to data banks and bulletin boards on extensive subjects. Examples of information presently provided via the Internet include text and commentaries of Supreme Court decisions, biologists mapping the human genome, musicians and their recordings, information on space flights and space science, weather data from around the world, chess strategies for students, polling data tabulated by the Harris organization from 1960 to the present and the full text listings of hundreds of books including the U.S. Constitution, the Koran, and the World Fact Book. Students without a connection to the Internet do not have access to this increasing volume of information. They are limited to research in various print encyclopedias, CD-ROMs including encyclopedias and atlases, laser discs, videotapes and books. Vast as this collection might be, the quantity and currentness of materials is limited by district budget allowances and various campus fund raising projects.

Educators would find value in using the Internet with their students because current discussion around constructivism in education supports the idea of the student, not the teacher, constructing the knowledge (Brennan, 1992). The massive increase in the quantity of information available today means we must adopt new approaches to both teaching and learning. It is quickly becoming more important to ask the right question than to have the right answer. The Internet is an immense tool whose use in the classroom would necessitate teachers serving as facilitators, assisting as students navigate along the Information Superhighway, rather than simply dispensers of knowledge.

The Internet provides an efficient forum for the exchange and display of student projects. This forum spans the entire world with over one million potential readers daily. Research has shown that when students write for a distant audience of their peers, their work is more fluent, better organized and more clearly stated and supported (Cohen and Riel, 1989). By giving children a sympathetic audience and something of value

to write about, and they will become eager writers. Viewing of student projects without a connection to the Internet is limited to a range of audiences from the classroom teacher to the entire campus.

Ninety percent of the traffic on the Internet involves electronic mail (Denison, 1994). Research has shown that students using electronic mail to discuss varying issues, learn how others regard and resolve similar issues, along with improving their writing and argumentative skills (Jensen, 1991/92). Interaction through networks breaks down typical communication problems. Users are less inhibited when using a computer for communication, thus facilitating the open exchange of ideas. Students who use electronic mail are continually working on their writing and reading skills.

In spite of the many benefits available to students from the use of the Internet, the intricacy of making a connection to the Internet has been frustrating to many (Wilson, 1992). Educators interested in connecting to the Internet need either a technical support educator on campus to handle the detailed network configurations, or the understanding of the details

involved themselves. In November of 1993, the Arizona State Department of Education connected to the Internet offering remote connections to teachers interested in its access. Over 2500 Internet addresses have been distributed since that date to educators across the state, however less than fifty percent have actually made the connection. (Cikalo, 1995). These numbers reflect an interest in using the Internet but a breakdown in the actual access to this technology.

Once a connection to the Internet has been established, users are left again with little training or support. Shedletsky (1992) found teaching an undergraduate course using computer mediated communication resulted in some student aversion to using electronic mail. Twenty percent of the final grade was based on use of e-mail. In the end, students believed electronic mail enhanced class discussions. Overall students enjoyed using electronic mail, but its success was fully

dependent on access to computers. Shedletsky's advised anyone interested in offering a similar course using computer mediated communication, to provide more explicit instructions in terms of how to use e-mail and more specific tasks to be performed with electronic mail.

Current research indicates a movement towards telecommunication training for preservice teachers. Most universities already have computer networks used by faculty, staff and students to increase and improve communication. Durham (1991) found that communication technology training in teacher education resulted in increased and more spontaneous communication between faculty and students. Preservice teachers also found that use of telecommunication tools enhanced their lesson planning and abilities in the class. It should be noted, however, that only 25% of current classroom teachers have had a college level computer course (Instructor, 1991).

Most research regarding student use of telecommunication tools involves one class connecting through a telephone and modem connection to another class, usually in a distant location. Pinney (1991) notes that long-distance writing for his students involved his merging all of his students' messages created on stand-alone computers into one file and sending them via a phone line to the cooperating teacher's electronic mailbox. That teacher then distributed printed hard copies of each student's message to his/her students and the process of responding started all over. This process is a means for improving and motivating student writing, however it is not electronic mail in the sense that individual students are not connecting directly to other students.

Ruberg and Sherman (1992) have found few controlled experiments dealing with computer mediated communication, CMC as they call it. They acknowledge that telecommunication is a rapid and efficient means of sharing information, however they point out that these benefits can only be realized, "after all the technical skills needed to use CMC have been mastered."

Wishnietsky (1991) suggests providing extensive training to all users prior to expecting telecommunications to be integrated into the curriculum. Training should include hands-on experiences provided by a technically competent instructor. While some teachers and administrators might resist new technology, students will most likely be drawn to the challenge. Students typically find the most difficult aspect of using electronic mail is simple access to a computer considering the high student to computer ratios found at most schools. Wishnietsky further suggests that students be taught computer ethics as they relate to telecommunication.

Heller (1994) discusses the evolution of electronic education occurring over decades as curriculum, technology, and budgetary restraints coalesce forming a climate that encourages educational reform. His advice for educators is, "to get your learner's permit and try a few test drives before that superhighway comes rolling through." The learner's permit requires structured, hands-on training.

Solution Strategy

The author in this study attempted to resolve the emerging problem of students connecting to the Super Information Highway by providing training and hands-on experiences, as recommended by Wishnietsky, for students on a local area network not connected to the Internet. Students were connected locally to learn the "Netiquette Rules of the Road," facilitate supervision, and establish the level of responsibility necessary prior to connecting globally. Students were walking slow to go fast; connecting locally in anticipation of eventual worldwide connection. As Ruberg and Sherman suggest, thorough training be provided to support the mastery of technical skills involved in the use of electronic mail.

The selection of the software used was a critical component of the program. There were several electronic mail applications, many that were easy to use, and each with its own advantages and disadvantages. QuickMail by CE Software, a common electronic mail application used by business,

government and educational institutions nationwide was chosen by the author to introduce students to electronic mail for the following reasons:

1. QuickMail was very easy to use,
2. QuickMail was currently used by all campus staff at the site,
3. QuickMail could be accessed from any computer on campus,
4. QuickMail allowed for the attachment of files such as student assignments, and
5. QuickMail had the potential to be connected to the community outside of the school site.

As a comparison of other programs designed to prepare students for telecommunications on the Internet, the author interviewed three computer teachers from other elementary schools within the district. None were implementing programs with students using e-mail. The author also posted a query with a worldwide educational discussion group on the Internet regarding use of local area e-mail with K-6 students. Educators responding to the post already had Internet access for their

students. However, students did not have individual e-mail accounts. One school created a generic account called "student" for use by all students in a particular class. Another school gave e-mail accounts only to teachers and allowed students to use their teacher's e-mail account with supervision. Interest was expressed by teachers responding to the post in the success of a local e-mail project as described in this report.

The connection of elementary students to the Internet is an emerging issue to be addressed by schools. Research is limited in dealing with this population. Shedletsky* did find students needed more direct instruction in the use of electronic mail to avoid student resistance. The author will follow this recommendation by having students first learn acceptable use rules pertaining to electronic mail. These rules, Netiquette Rules of the Road, apply regardless of whether the mail is local or global. Students will then be provided explicit assignments using electronic mail. Responsibility will be encouraged through close supervision. Rule violations will result in suspension of electronic mail privileges.

The practicum author expects students to eagerly embrace the use of electronic mail, as Durham found with preservice teachers. The heart of computer networking is human association and interaction. As with any emerging educational issue, students using the new technology will provide further insight into design and implementation of the on-ramp to the Super Information Highway.

CHAPTER III:

Method

It was necessary to enlist the cooperation of a classroom teacher and the building principal to implement the project. Approval was needed from the principal to utilize the computer lab twice a week with the target group beyond their regularly scheduled computer lab time. The cooperating classroom teacher completed a survey and signed an agreement indicating endorsement of the project.

Hardware and software configurations to support the project were completed prior to the beginning of the twelve week implementation of the practicum. The computer lab was networked to support the use of a local area network (LAN) for electronic mail. A mail server was established using C.E. Software's QuickMail with all students and teachers involved entered as users. Initial passwords were users' last names. Software was installed on all computers in the computer lab to allow access to the LAN e-mail. The principal's and the classroom teacher's home computers were configured

to support dial-in access to the LAN to provide expanded mail handling capabilities. This provided the users with a home to school connection for reading, sending and editing electronic mail to and from the targeted students.

The classroom teacher and the principal were trained in the use of QuickMail. A twice weekly schedule was established for use of the computer lab during the next twelve weeks. Changes to this schedule were made on a week-to-week basis to accommodate unanticipated events in the school day. A cooperative effort between the principal, classroom teacher, and author assisted in making these adjustments and ensuring successful implementation of the project.

During the first week, students received a copy of the guide "Netiquette Rules of the Road" (Appendix D: 53). Using the included pneumatic device, students memorized the ten

rules necessary for successful use of electronic mail. It was explained to students that in the same sense that one learns to drive an automobile in something like a church parking lot, rather than a freeway, so too will they learn to drive on the Super Information Highway by first learning a few rules of the road applied on a local basis.

During the second week of implementation students used the computer to develop a simple HyperCard (Apple, 1993) multimedia presentation showing their understanding of the rules of the road. When it became apparent to the author, that due to time limitations, students would have difficulty presenting all ten "Netiquette Rules of the Road" in their individual presentations, cooperative learning teams were established. Students worked together, sharing the responsibility for developing a complete presentation including all ten "Netiquette Rules of the Road." A higher understanding of the rules was apparent following the completion of the multimedia presentations.

Students began using QuickMail three weeks into the implementation of the program. Students learned to send and

receive simple notes to and from classmates, the principal, the author and the classroom teacher. Students were continually reminded of the need to apply the "Netiquette Rules of the Road." The author recognized to the entire class when a student was observed following a particular rule of the road. Many students were anxious to write and send their mail without first using spell check. Commendation by the author of students using spell check was a successful means for increasing the use of spell check by other students. Students were also encouraged to watch for violations of these rules and report any questionable behaviors to the author. The author discussed violations with individual users and then the entire class. Self monitoring of peers also served to enhance the understanding of the "Netiquette Rules of the Road."

Students learned to attach and retrieve files to and from their electronic mail messages beginning the fourth week. The author sent attached files to students and in return asked students to send attached files to the author. The author chose

to send a digital jigsaw puzzle to each student. The challenge to solve the puzzle motivated students to retrieve the attached file and then in return, send their solution back to the author.

During the same time period, students received instruction on changing their passwords. The author maintained a list of all passwords in case a password was forgotten. Some students had difficulty changing their passwords by inadvertently entering the new password when prompted for their old password, and vice-versa. One student who could successfully change his/her password, and who could be trusted not to share others' passwords, was declared the Official Password-Pundit. Whenever a student wanted to change his/her password, s/he would elicit the help of the Official Password-Pundit. Changes were then recorded by the author on the master password list.

During the sixth week of instruction, students were shown how to delete unneeded files from their mailboxes. The author monitored this upkeep both visually and through the QuickMail Administration program. Unintentional deletion of a file was never a problem because all files were generated

locally and could readily be resent. This would not be the case if students were using the global network for e-mail.

Students began to show fluency in their use of electronic mail by the seventh week. Students demonstrated the ability to attach comments to a message from the author and forward the appended message to the principal. The author received feedback from the principal concerning the number of appended messages received and record these results on the Observation Checklist (Appendix B: 48). It was during the seventh week that students realized, without author instruction, they could also use QuickMail for real time discussions. That is, students could request a chat session with another student who was working at a computer and logged into QuickMail. Connected students could then dialog back and forth without use of the standard e-mail protocols. The author discouraged this practice because it did not directly correlate with the goals of the project. This is an area that would benefit from further research.

Students continued to use the computer lab to send, retrieve, delete, attach and file e-mail during weeks eight through 11. The classroom teacher gathered information from students using e-mail regarding issues specific to the classroom. These issues included assignments, evaluations, preferences, and concerns. The author continued to work with students having difficulty maintaining their mailboxes and attaching files. Students also used e-mail in a social context, communicating with classmates on a variety of issues ranging from after-school activities to cooperative classroom projects.

Students possessed all the skills necessary to use e-mail on the local area network at the end of twelve weeks of implementation. Students and staff will be surveyed regarding violations of the Netiquette Rules (Appendix C: 50). A compilation of this survey will be added to the Observation Checklist (Appendix B: 48).

CHAPTER IV:

Results

Evaluation criteria was established that correlated to the objectives specified in chapter one. Following is a description of the objectives, the evaluation process, tools used to augment this evaluation, and the results of the evaluation.

The first objective stated 90 percent of the study group would be able to list all ten Netiquette Rules of the Road for electronic mail following two weeks of implementation of the Driver's Education for the Internet Program. Following two weeks of training, 93 percent of the students could list all ten rules as indicated on the Observation Checklist (Appendix B: 54). Several samples of an author administered test created and sent in QuickMail by the students are included (Appendix A: 51). The order of the listing was not relevant.

The second objective stated that following three weeks of implementation, 100 percent of the study group would be able to send and receive a message to and from the author as evidenced by the author's and student's receipt of the message at a computer. One hundred percent of the students were able to master this objective as indicated on the Observation Checklist (Appendix B: 54). The author's mail log, an on-going account of messages sent in QuickMail, provided evidence of students' receipt of sent messages. The mail log displayed all mail sent by a user and it's current status as read or unread.

The third objective stated 75 percent of the study group would be able to attach and retrieve a file with an electronic mail message to the author after four weeks of implementation. Evidence of this objective was twofold. Students' ability to attach files was evidenced through the author's receipt of messages from students with files attached. Students' ability to retrieve files was evidenced through display of the file at student computers. Some students had difficulty with this objective. The concept of an attached file being separate and

different from an e-mail file caused some confusion. The results of this evidence was notated on the Observation Checklist (Appendix B: 54) indicating 78.57 percent of the students could attach and retrieve appended files.

The fourth objective stated 100 percent of the study group would be able to delete a message from the author in their electronic mailboxes following six weeks of implementation. Failure to delete unnecessary messages from mailboxes will result in system overload on the computer functioning as the mail server. Messages that are not deleted accumulate on the mail server consuming valuable hard drive space. Students had no difficulty deleting unnecessary files. A success rate of 100 percent was notated by the author on the Observation Checklist (Appendix B: 54).

The fifth objective stated 80 percent of the study group would be able to append comments to an electronic message from the author and forward the appended message to the principal after seven weeks of implementation. Evidence was receipt of the appended message at the principal's computer. The message from the author was in the form of a

questionnaire, requesting individual student input to the principal on a current campus issue. The principal replied to the author via e-mail, the names of all students who successfully added comments and forwarded the message. The principal also sent personal e-mail messages to each student acknowledging their ability to communicate electronically. The author indicated a 75 percent success rate on the Observation Checklist (Appendix B: 54).

The sixth and final objective was to have no violations of the school's Netiquette Rules of the Road by at least 85 percent of the study group at the conclusion of the project. Staff and students were surveyed regarding violations of the Netiquette Rules with results added to the Observation Checklist (Appendix B: 54). Violation of a rule was determined through student/teacher/author discussion. The author acknowledged some gray area in interpreting such violations and therefore allowed for student input prior to affirming if a violation occurred. Eighty-nine percent of students had no violations of the school's Netiquette Rules of the Road.

The author was able to show a large gain of knowledge in students' ability to effectively use electronic mail. Less than four percent of the class had ever used electronic mail prior to this study. Skills gained as a result of this project will directly impact these students as they move into the digital age of the 21st century.

CHAPTER V:

Recommendations

The results of this practicum were shared in a variety of settings. Initially, the author presented the findings to the Journey School Team, including the principal. As this program did prove to be a successful solution to the introduction to students to electronic mail, a suggestion was made to expand the program by including all fifth and sixth grade students and their respective classroom teachers during the 1995-96 school year.

As a result of the success of this program, funding was procured to establish the hardware and software needed to connect the school directly to the Internet and provide students, teachers, and families with Internet electronic mail accounts. The author established this service during the summer of 1995. Beginning the fall semester of 1995, students, and their parents, in grades five and six will follow an

introductory program similar to this project. Following successful completion of training on the local e-mail system, students and their families will receive full Internet e-mail accounts allowing for global access to a wealth of information.

On a district-wide basis, the author shared the results of this practicum with the Computer Education Coordinator and other elementary computer teachers. Replication of this program within the district has few limitations given that all district elementary campuses have the hardware and networking necessary for implementation on a local basis.

On a world-wide basis, the author posted an offer to share the results of this practicum with other educators in discussion groups on the World Wide Web. The availability of a wide variety of hardware, software and networking peripherals will be instrumental in determining the ability of global educators to replicate this practicum.

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Appendices

APPENDIX A
NETIQUETTE RULES TEST SAMPLES

Netiquette Rules Test Sample 1
as submitted, unedited via e-mail

From: Student 3 (5/18/95)

To: Bev Kilgore

1:13 PM 5/18/95

About: 10 Rules

- 1.Privacy-don't look on other peoples computers
- 2.Polite-send nice measages
- 3.Spell Check-after writing messages you should use spell check for your spelling
- 4.Appropriate Language-use only nice words when talking or while your sending a message to someone
- 5.Protect Password-don't tell others your password so that they can't look at your private stuff
- 6.One Subject-stick to one subject on your e-mail
- 7.Mailbox Clean-you can only have a certain amount of notes have to delete notes after reading them
- 8.Audience Choice-don't send things over and over again
- 9.Brief-get things to the point and make it brief
- 10.Don't shout-don't send notes that is all capitalized

Netiquette Rules Test Sample 2
as submitted, unedited via e-mail

From: Student 3 (5/18/95)

To: Bev Kilgore

5/18/95 1:12 PM

Rules of the Road

The rules of the road are...

1. privacy-don't look on other computers
2. Polite-write kind letters
3. spell check-use spell check
4. audience choice-don't write letters to people you don't need to
5. protect password- don't tell any one your password
6. one subject-keep your letters on one subject
7. mailbox clean-don't keep letters you don't need
8. appropriate language-don't say bad words
9. brief-keep letters short
10. don't shout-don't use all caps

APPENDIX B
OBSERVATION CHECKLIST

Observation Checklist

Student No.	List 10 Rules	Send & Receive	Attach & Retrieve	Delete Messages	Append Messages	No Violations
1	pass	pass	pass	pass	pass	pass
2	pass	pass	no pass	pass	no pass	pass
3	pass	pass	no pass	pass	no pass	pass
4	pass	pass	pass	pass	pass	pass
5	pass	pass	pass	pass	pass	pass
6	pass	pass	pass	pass	pass	pass
7	pass	pass	no pass	pass	no pass	pass
8	pass	pass	pass	pass	pass	pass
9	pass	pass	no pass	pass	no pass	pass
10	pass	pass	pass	pass	pass	pass
11	pass	pass	pass	pass	pass	pass
12	no pass	pass	no pass	pass	no pass	no pass
13	pass	pass	pass	pass	pass	pass
14	pass	pass	pass	pass	pass	pass
15	pass	pass	pass	pass	pass	pass
16	no pass	pass	no pass	pass	no pass	pass
17	pass	pass	pass	pass	no pass	pass
18	pass	pass	pass	pass	pass	pass
19	pass	pass	pass	pass	pass	pass
20	pass	pass	pass	pass	pass	pass
21	pass	pass	pass	pass	pass	no pass
22	pass	pass	pass	pass	pass	pass
23	pass	pass	pass	pass	pass	pass
24	pass	pass	pass	pass	pass	pass
25	pass	pass	pass	pass	pass	no pass
26	pass	pass	pass	pass	pass	pass
27	pass	pass	pass	pass	pass	pass
28	pass	pass	pass	pass	pass	pass
Total	26	28	22	28	21	25
Percent	92.86%	100.00%	78.57%	100.00%	75.00%	89.29%

APPENDIX C
VIOLATION SURVEY SAMPLES

Violation Survey Samples

Select student responses to the following e-mail message from the author:

Date: 5/11/95 12:50 PM

From: Bev Kilgore

Have you seen or experienced any violations of the rules of e-mail?

Please let me know any problems you've seen or heard about. Don't use names... just details! Thanks, Mrs. Kilgore

Response from Student 3:

There is one thing someone keeps looking at my computer while I am typing something to my friend.

Reponse from Student 5

Yes, I've gotten mail with all caps. before. You're right it does feel like their yelling at you.

Reponse from Student 7

Some people in the class are not spelling words correctly, and are not using spell check.

Reponse from Student 9

Dont shout and spellcheck are the only violations i've seen.

Reponse from Student 11

Some one sent me their phone number.

Reponse from Student 14

I have not seen anyone break the rules.

Reponse from Student 19

I've not seen any violations.

Reponse from Student 23

To tell you the truth I haven't seen any violations.

Reponse from Student 26

I didn't see any violations.

Reponse from Teacher A

The few messages I received were fun--the only annoying part was that occasionally some kid would get into that conference format and interfere with what I was working on.

Reponse from Principal

I have been very impressed with the student use of E-Mail at the fifth grade level, and I have found that they have not only learned a great deal but have enjoyed the opportunity. I have not seen any inappropriate uses of E-Mail.

In my judgment, this was a great test case. I would be very happy to see this opportunity expanded to other students.

APPENDIX D
NETIQUETTE RULES

Sonoran Sky
SkyMail
Netiquette Rules

Student Pilot Program
Spring, 1995

Name _____

SkyMail Netiquette Rules

1. BE POLITE. Never send, or encourage others to send, disrespectful messages.
2. USE APPROPRIATE LANGUAGE. What you say represents your class and our school.
3. RESPECT PRIVACY. Do not provide private information, such as phone numbers or addresses, of yourself or any other students.
4. BE BRIEF. Keep your messages short. People might not bother to read long messages. Long messages are more difficult to answer.
5. ONE SUBJECT PER MESSAGE. Use a clear subject title for the message. This helps the user find the message quickly.
6. DON'T SHOUT. Writing in all capital letters is considered SHOUTING!
7. PROTECT YOUR PASSWORD. Do not give your password to anyone.
8. USE SPELL CHECK. Use spell check to help people better understand your message.
9. CHOOSE YOUR AUDIENCE. Choose the best audience for your message carefully. Don't send your message to everyone if everyone does not need to read it.
10. CLEAN YOUR MAILBOX. Delete old messages from your mailbox so you don't fill up the network's mail server.

If you like simple “tricks” to help you memorize
lists, try this one...

Please (**polite**)
put (**privacy**)
salt (**spell check**)
and (**appropriate language**)
pepper (**protect password**)
on (**one subject**)
my (**mailbox clean**)
awful (**audience choice**)
bologna (**brief**)
sandwich (**don't shout**).

Practicum Software Evaluation Form

AUTHOR: CE Software

TITLE: QuickMail Version 3.0.3

CHECK ALL THAT APPLY

TYPE: ☐ Academic Game ☐ Drill and Practice
☐ Administrative ☐ Simulation
☐ Test/Diagnostic ☐ Tutorial
☐ Problem Solving ☒ Other

LEVEL: ☐ Preschool ☐ K-3 ☒ 4-6 ☒ 6-8 ☒ 9-12 ☒ Adult

PURPOSE: ☐ Remediation ☒ Developmental ☐ Enrichment

HARDWARE: Computer: Macintosh LC575 K Ram required: 1024 Color: Y ~~XXX~~

Number of Drives: 1 Printer: Y ~~XXX~~ Other: CD-ROM

CONTENT

- | | Circle | Rating |
|---|--------|--------|
| 1. Program has educational value | (X) | N NA |
| 2. Grammar accurate and free of syntax errors | (X) | N NA |
| 3. Stereotype-free (race, ethnic, sex, etc.) | (X) | N NA |
| 4. Content adaptable to varied instructional strategies | (X) | N NA |

INSTRUCTIONAL QUALITY

- | | | |
|--|-----|------|
| 5. Purpose of the program well defined | (X) | N NA |
| 6. Defined purpose achieved | (X) | N NA |
| 7. Presentation of content clear and logical | (X) | N NA |
| 8. Level of difficulty appropriate for target audience | (X) | N NA |
| 9. Sequence organized for selected developmental steps | (X) | N NA |
| 10. Graphics, color, sound appropriate for instruction | (X) | N NA |
| 11. Student controls rate and sequence of presentation | (X) | N NA |
| 12. Program self-paced and controls the sequence | (X) | N NA |
| 13. Entry level prerequisites specified | (X) | N NA |
| 14. Program user-friendly, easy-to-read, understand | (X) | N NA |

TECHNICAL QUALITY

- | | | |
|---|-------|------|
| 15. Instructional text formatted/sized for easy reading | (X) | N NA |
| 16. Students easily operate program independently | (X) | N NA |
| 17. Relevant computer capabilities used | (X) | N NA |
| 18. Program reliable and student-proof | (X) | N NA |
| 19. Adequate error trapping | (X) | N NA |
| 20. Easy escape from program provided | (X) | N NA |
| 21. Record keeping/printouts of student progress | Y (X) | NA |

DOCUMENTATION

- | | | |
|--|-----|------|
| 22. Manuals available and user-friendly | (X) | N NA |
| 23. Clear operating instructions and trouble shooting | (X) | N NA |
| 24. Constant reference to documentation unnecessary | (X) | N NA |
| 25. Table of Contents, Index, Glossary of Terms provided | (X) | N NA |

Practicum Software Evaluation Form

AUTHOR: Apple Computer, Inc., Claris Corporation

TITLE: HyperCard

CHECK ALL THAT APPLY

TYPE: ☐ Academic Game ☐ Drill and Practice
☐ Administrative ☐ Simulation
☐ Test/Diagnostic ☐ Tutorial
☐ Problem Solving ☒ Other

LEVEL: ☒ Preschool ☒ K-3 ☒ 4-6 ☒ 6-8 ☒ 9-12 ☐ Adult

PURPOSE: ☐ Remediation ☒ Developmental ☐ Enrichment

HARDWARE: Computer: Macintosh LC575 K Ram required: 1050 Color: Y ~~XXX~~

Number of Drives: 1 Printer: Y ~~N~~ Other: CD-ROM

CONTENT

- | | Circle | Rating |
|---|----------------------------------|--------|
| 1. Program has educational value | ☒ | N NA |
| 2. Grammar accurate and free of syntax errors | ☒ | N NA |
| 3. Stereotype-free (race, ethnic, sex, etc.) | ☒ | N NA |
| 4. Content adaptable to varied instructional strategies | ☒ | N NA |

INSTRUCTIONAL QUALITY

- | | | |
|--|------------------------------------|------|
| 5. Purpose of the program well defined | ☒ | N NA |
| 6. Defined purpose achieved | ☒ | N NA |
| 7. Presentation of content clear and logical | ☒ | N NA |
| 8. Level of difficulty appropriate for target audience | ☒ | N NA |
| 9. Sequence organized for selected developmental steps | ☒ | N NA |
| 10. Graphics, color, sound appropriate for instruction | ☒ | N NA |
| 11. Student controls rate and sequence of presentation | ☒ | N NA |
| 12. Program self-paced and controls the sequence | Y ☒ | NA |
| 13. Entry level prerequisites specified | ☒ | N NA |
| 14. Program user-friendly, easy-to-read, understand | ☒ | N NA |

TECHNICAL QUALITY

- | | | |
|---|------------------------------------|------|
| 15. Instructional text formatted/sized for easy reading | ☒ | N NA |
| 16. Students easily operate program independently | ☒ | N NA |
| 17. Relevant computer capabilities used | ☒ | N NA |
| 18. Program reliable and student-proof | ☒ | N NA |
| 19. Adequate error trapping | ☒ | N NA |
| 20. Easy escape from program provided | ☒ | N NA |
| 21. Record keeping/printouts of student progress | Y ☒ | NA |

DOCUMENTATION

- | | | |
|--|----------------------------------|------|
| 22. Manuals available and user-friendly | ☒ | N NA |
| 23. Clear operating instructions and trouble shooting | ☒ | N NA |
| 24. Constant reference to documentation unnecessary | ☒ | N NA |
| 25. Table of Contents, Index, Glossary of Terms provided | ☒ | N NA |